

CONTINUOUS PROGRAM IMPROVEMENT

A. Program Educational Objectives

Table 4.1 summarizes the assessments that are done on Students, graduates, stakeholders (employers) and faculty in the program.

Criterion	Assessments (source)	Purpose	Schedule
1. Students/graduates	1. Admissions		
	Reason for not accepting offer of admission (all refusals)	Learn why students go elsewhere	Annual
	Reason for attending UC and result of other applications (all who attend) *	Learn why students choose UC and the actions of programs they consider “comparable	Annual
		Undergraduate performance and other application data (files of applicants)	Understand our decisions
	2. Retention	Identify barriers to program completion	Annual
	Review of residency status (files of those who leave without degree)		Each Quarter/Semester
	3. Graduation Requirements	Identify gaps in academic progress	End
Review of course tracking (student file/advisor)	Identify delayed milestones	Annual	

	<p>Seven steps checklist (student file/advisor) **</p> <p>Department checklist (Graduate Studies)</p> <p>Time to graduation (files of those who have attended)</p>	<p>Identify any element of noncompliance</p> <p>Identify barriers to program completion</p>	
2. Program Educational Objectives	<p>1. Exit feedback on perceived competencies (student leaving residency) *</p> <p>2. Alumni survey of job activities and confidence (alumni)</p> <p>3. Alumni Survey of PEOs</p> <p>4. Survey of Alumni Employers</p>	<p>Evaluate self-efficacy of graduates to achieve objectives in first/next job</p> <p>Identify gaps in objectives among practitioners</p> <p>Achieve goals of training and professional accomplishments</p> <p>Achieve goals of training and professional accomplishments</p>	<p>Annual</p> <p>Bi-annual</p> <p>Bi-Annual</p> <p>Bi- OR TRI Annual</p> <p>Bi- OR TRI Annual</p>
3. Student Outcomes	<p>1. Student feedback on overall program (current students)</p> <p>2. Student evaluation of courses (current students)</p> <p>3. Student grades (Graduate</p>	<p>Identify barriers to achieving outcomes</p> <p>Identify course deficiencies/gaps</p> <p>Identify shortcoming in performance</p>	<p>Annual</p> <p>Each Quarter/Semester</p> <p>Each Quarter/Semester</p>

	<p>Studies)</p> <p>4. Surveys of educational needs-done by others (external sources)</p> <p>5. Faculty measurable outcomes (faculty)</p> <p>6. Student Evaluations of KSAs for each class by faculty</p> <p>7. MS Thesis Process</p>	<p>Identify gaps in outcomes</p> <p>Evaluate goals of program content, meeting attendance, presentations and publications</p> <p>Determine if each student mastered the specific KSAs of the course</p> <p>Cumulative skills evaluation</p>	<p>As available</p> <p>Each course beginning 2012</p> <p>Each graduating student</p> <p>Each thesis</p>
4. Professional Component	<p>1. Exit Survey item regarding CIH exam (all leaving residency) *</p> <p>2. Alumni Survey items regarding CIH exam and CE (alumni)</p>	<p>Identify plans regarding CIH</p> <p>Evaluate achievement of graduates on CIH exam and participation in CE</p>	<p>At exit</p> <p>Bi-annual</p>
5. Faculty	<p>1. Faculty Measurable Outcomes (faculty)</p> <p>2. Annual faculty</p>	<p>Identify shortcomings in publications, participation in annual review with chair, contributions to CE and consultations</p>	<p>Annual</p> <p>Annual</p>

	review by Dept. Chair (department)	Identify unmet goals	
--	--	----------------------	--

Assessment of Program Educational Outcomes requires interaction with our alumni and their employers. The Office of Graduate Studies and the Division faculty coordinate efforts to track the professional path of our graduates. For example, this year we sent an Alumni Questionnaire to 25 student who graduated since 2007. We also sent an Employer Questionnaire to the immediate supervisor of each graduate/employee. If necessary we used the ABIH website (<http://74.50.62.73/about-abih/public-roster>) for corroboration of certification.

Table 4.2 Assessment Methods used for Program Educational Outcomes				
Program Educational Objective	Alumni Database	Alumni Survey	Employer Survey	ABIH Information
Employed in IH or related field	Employer, name and position	% of time in IH or related	% of time in IH or related	
Technical and scientific competence		Rating Scale	Rating Scale	
Design long range programs and goals		Rating Scale	Rating Scale	
Solve real-world problems		Rating Scale	Rating Scale	
Communicate their science effectively, at every level of the organization		Rating Scale	Rating Scale	
Interact as part of a team to solve problems		Rating Scale	Rating Scale	
Be ethical in their practice and behavior		Rating Scale	Rating Scale	
Be involved in continuous improvement		Categorical scale	NA	
Be or seek certification		Intention/attempt/success	NA ¹	Number Applied/passed or failed
Participate in		Yes/No; indicate which		

professional IH societies				
¹ were asked how important they felt certification was for their employees In addition, discussions are held with the External Advisory Committee on emphasis for PEOs. The results of all surveys are forwarded and discussed with the EAB prior to any changes in the program				

Expected Level of Attainment

The Program and the EAB have not set a quantitative level of attainment for the PEOs. The data from the Alumni and Employer surveys are used comparatively to determine if both stakeholders agree that the PEOs are being met and where any disconnects occur in performance or achievement between the Alumni and their Employers. Qualitatively we expect that:

1. A large majority of program graduates will work in industrial hygiene or closely related fields such as safety or environmental management.
2. In surveys, alumni and their employers will report positively on the graduate’s preparation, scientific competence and their ability to solve real world problems. This will include Rating scale ratings overwhelming above “Better”, no “worse than” ratings, and generally favorable comments.
3. In surveys, alumni and their employers will report positively on the graduate’s communications ability. This will include ratings overwhelming above “Better”, and no “worse” ratings.
4. In surveys, alumni and their employers will report positively on the graduate’s ethical preparation and actions. This will include ratings overwhelming above “Better”, and no “worse” ratings.
5. A large majority of program graduates will report an intention to pursue appropriate professional certification.
6. Substantial numbers of program graduates will achieve professional certification.
7. When success rates on certification exams can be determined, the success rate of our program graduates will be at least as good as the average for ABET accredited programs.
8. Alumni will regularly participate in Continuing Education (CE) with the majority participating in at least one CE course or program each year since graduation
9. Alumni will become active members in professional societies. We anticipate that a substantial majority of the Alumni will report being member so of AIHA, ACGIH and/or ASSE or other professional occupational health society.

Evaluation process and results. Summaries of assessment data are reviewed by the faculty and the EAB at regular meetings, and may form the basis for recommendations to change the program if indicated. The results of the evaluation process for educational objectives during the current accreditation cycle (2007 to the present) are summarized in Table 4.3. Overall, the program educational objectives with respect to professional IH practice are being met. “Repeat business” – the hiring of a series of program graduates by the same organization – provides especially strong evidence that our graduates are performing effectively. Success of graduates at achieving professional certification is in line with national levels.

Documentation of the assessment and evaluation processes is maintained by the Program Director.

Table 4-2. Evaluation of Attainment of Program Educational Objectives

Program Educational Objective	Summary of metrics	Evaluation of attainment
Employment of 2007-2011 graduates in Occupational Health Fields (from database and questionnaire)	25 mailed; 20 alumni (80%) and 14 (56%) employers responded 20/20 report 10-100% activity in EOH in their current job 17/19 report that employment is at least 90% in industrial hygiene or related field. All graduates known to want employment in the EOH profession have succeeded in finding suitable jobs.	Very Acceptable. Excellent response rate suggests loyalty to program
<p>Alumni, Employer surveys for 2007-2011 graduates, conducted in 2012</p> <p>What % effort are you devoting to EOH?</p>	Average of 91% and 88% time devoted to EOH by Alumni and Employers, respectively.	Very Acceptable. Strong concordance between reports of Alumni and Employers
Technical expertise including basic knowledge, participation in settings goals and programs including global efforts	92% of Alumni and 84% of Employers rate at least “Better” than those grads of other programs	Very Acceptable. Strong concordance agree on a good acumen rating
Solving real world problems using all IH skills and their application	93% of Alumni and 84% of Employers rate at least “Better” than those grads of other programs	Very Acceptable. Strong concordance on a good acumen rating
Communicate effectively at all levels	97% of Alumni and 69% of Employers rate at least “Better” than those grads of other programs	Acceptable, however, discordance suggests some improvement is necessary in this area. Given to the EAB for evaluation
Apply professional ethics in all aspects of practice	92% of Alumni and 77% of Employers rate at least “Better” than those grads of other programs	Very acceptable. Some discordance suggests that this area should be watched.
Intentions toward Certification	4/20 (20%) were certified (all CIH); 13/15 indicated they would be taking the exam before 2015. 4 indicated they would take the exam in 2012. 92% of employers indicated that they considered certification “Important”, or “Very Important”	Acceptable. Disconcerting that 3/20 (15%) had “no interest” in certification. Employers have strong interest and suggest that this be an increasing emphasis area.

Continuing Education Activities	71% (14/20) have taken “at least 1” CE course or program EAH year since graduation	Barely acceptable. 3/20 (15%) have no plans to take CE courses or programs. Another emphasis area
Member of a professional organization, AIHA, ACGIH, ASSE or other	17/20 belong to at least 1 professional organization Only one “other”.	Very Acceptable.

The questionnaire was issued electronically and the results are maintained on the Shared (R:) drive in the folders “questionnaire replies alums” and “questionnaire replies employers”.

B. Student Outcomes

The assessment methods for student outcomes are listed in Table 4.1. Students evaluate both the entire program and each course to suggest improvements. The faculty respond to comments and the evaluations and responses are maintained on the ABET Share Drive (R:). Comments are taken especially seriously when they suggest that important information may not have been covered or if it was covered poorly. The individual instructor responds to comments but the program faculty have input and changes in the program including faculty changes have been the result. These are maintained by the program and will be available to the site visitors. Student grades are also used to determine generally if the Student Outcomes are being met. These are reviewed each term by the program faculty. Students who fail to meet the standards detailed in the student handbook for academic performance are placed on probation and may lose funding. Students are expected to maintain a GPA of 3.0 in the entire program and a minimum of a “B” in each required course. Students can be reinstated to “good standing” status after one term by improving their grades.

The faculty also pay close attention to surveys conducted by other institutions and published in the peer reviewed journals; an example is the work of Brosseau ([Am Ind Hyg Assoc J](#), 1995 Sep;56(9):905-10). The program faculty measurable outcomes (meeting attendance, CE publications, presentations, activities) are also evaluated to ensure that faculty are current or continue to be leaders in the field.

Beginning in 2012 we have adopted a process where each student in the program are rated by the faculty relative to KSAs established for each course. The KSAs for each course have been established and are maintained on the website (for example: http://www.eh.uc.edu/ih/pdfs/abet_course_Objective/ABET-26-EIH-707.pdf) the faculty then asked how well did the student attain the knowledge, skills or attitude that was established for the class. The rating scale used was(in increasing order): 1=no evidence, 2=developing, 3=good, and 4=exemplary. These ratings are stored in the Share Drive (R:) in the folder “Student Evaluations by Course”. Students are expected to attain minimum marks of 2.0 in every rating, with an overall average of 3.0 for a course and within the program. This year students have achieved these levels.

For the coming years we anticipate transitioning in a yet more quantitative approach to evaluation using examination questions (in those courses where examinations are given) which

will allow the student to demonstrate their prowess for the specific KSAs in the given course. This will be phased in at least one course (26-EIH-7007) for the fall 2012 term. If successful, it will be used in a wider range of courses. In the meantime and in the courses without formal examinations, we will continue to use the evaluation method developed above.

In many ways each student's master's thesis represents the cumulative knowledge, skills and attitudes the student has developed while in the program. The thesis serves as a key measure of student outcomes relating to skills and abilities to apply professional knowledge, design and conduct an experiment or observational study, analyze and interpret data, and communicate effectively with professional peers, at a minimum, their committee. The thesis process includes the student performing a thorough literature review in their selected area. The student then formulates a research question, determines which professionals (faculty and staff) may assist them in addressing the research question. The student must draft and finalize a statement of intent that defines the research hypotheses, scope, study design, and methods. They must then organize resources and expertise to collect, analyze, and interpret the data obtained. The student must draft and finalize an acceptable thesis that conforms to common standards for scientific papers and the specific input from their committee. Every student in the program must complete the thesis process to the satisfaction of their committee.

Since Student Outcomes are mapped to the Program Educational Objectives the rating of recent graduates by their employers detailed in Table 4-2 can also be used to evaluate the attainment of SOs. In this area we expect that all would perform "at least as well as graduates of other programs" and, in fact, this was attained in the 2012 survey.

C. Continuous Improvement

The faculty working with the EAB remain the main evaluative and driving force for program improvement based upon the data collected from the various assessments undertaken. The faculty and the EAB begin the evaluation process by recommending evaluation techniques and attainments, by evaluating the data and postulating what the data indicate, and by suggesting changes in the program as a result of the data collected.

The data collected from the 2012 PEO questionnaire form Alumni and Alumni Employers will provide the grist for new program emphasis areas especially the need for improving communication skills and emphasizing certification and continuing education. These were indicated by the discordant results of the Employer versus the Alumni Surveys regarding communication skills and the need for certification which employers valued more than some students. In addition, some students (albeit a minority, 15%) did not see the need for participation in CE programs. The program will take pains to try to eliminate this attitude in our graduates.

D. Additional Information

Copies of any of the assessment instruments or materials referenced in 4.A, 4.B, or 4.C must be available for review at the time of the visit. Other information such as minutes from meetings where the assessment results were evaluated and where recommendations for action were made could also be included.

